AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (*currently amended*) A method of detecting a biological analyte within a sample, wherein said analyte can be electrically charged or polarized in the presence of an electric field, said method comprising:

~~placing said sample on a surface of a ferroelectric transducer~~immobilizing said analyte in said sample on a ferroelectric transducer having a planar test surface having a specific affinity to said analyte for selectively capturing or binding said analyte in said sample;

disposing said transducer and said sample between first and second electrodes, wherein said first electrode is in contact with said transducer while said second electrode is in contact with said sample;

establishing an electric field to polarize said analyte in said sample;

sensing an electric response of said ferroelectric transducer resulting from the effect of said electric field in said sample on said ferroelectric transducer, and indicative of the presence of said analyte in said sample.

2. (*previously presented*) The method of claim 1, further comprising determining a signal difference between said electric response and a reference signal, said signal difference being indicative of the presence of said analyte.

3. (*original*) The method of claim 2, wherein said signal difference is indicative of the concentration or density of said analyte.

4-5. (*canceled*)

6. (*previously presented*) The method of claim 1 wherein said electric response is said voltage when a pre-selected electric current is flowing between said electrodes.

7. (*previously presented*) The method of claim 1 wherein said electric response is the electric current flowing through said electrodes when a voltage is applied to said first and second electrodes and said voltage has a pre-selected value.

8. (*previously presented*) The method of claim 1, wherein said ferroelectric transducer comprises one or more of $Ba_xSr_{1-x}TiO_3$ (BST), $Pb(Zr_xTi_{1-x})O_3$ (PZT) and ferroelectric polymers, wherein x is between 0 and 1.

9. (*previously presented*) The method of claim 1 wherein said transducer is a thin film.

10. (*previously presented*) The method of claim 1 wherein said analyte is one of protein, DNA, virus, antigen-antibody, bacteria, fungus, and drug.

11-12. (*canceled*)

13. (*currently amended*) The method of claim [[11]]1, wherein said test surface comprises a coating of probe molecules having a specific affinity to said analyte, and wherein said immobilizing comprises selectively binding said analyte to ~~a probe molecule attached to said transducer,~~ said probe ~~molecule having specific affinity to said analyte~~molecules.

14. (*original*) The method of claim 12, further comprising, after immobilizing said analyte on said transducer and before said sensing, removing a remaining portion of said sample and attaching a probe molecule to said analyte, said probe molecule having specific affinity to said analyte, and wherein said electric response is indicative of the presence of said probe molecule and thus said analyte.

15. (*currently amended*) A sensor for detecting a biological analyte within a sample, wherein said analyte can be electrically charged or polarized in an electric field, said sensor comprising:

a ferroelectric transducer having a planar test surface having a specific affinity to said analyte for selectively capturing or binding said analyte in said sample;

a biological sample disposed on ~~a~~ said test surface of said transducer, wherein said analyte in said sample is immobilized on said transducer via the specific affinity of said test surface to said analyte;

first and second electrodes for establishing a potential difference across said sample to generate an electric field in said sample and to polarize said analyte in said sample;

wherein said first electrode is in contact with said transducer and said second electrode is in contact with said sample; and

an electric signal detector for sensing an electric response of said ferroelectric transducer resulting from polarization of said analyte, and indicative of the presence of said analyte in said sample.

16. (*original*) The sensor of claim 15 further comprising a source connected to one or more of said first and second electrodes for applying a voltage to said first and second electrodes.

17. (*previously presented*) The sensor of claim 15 wherein said ferroelectric transducer comprises one or more of $Ba_xSr_{1-x}TiO_3$ (BST), $Pb(Zr_xTi_{1-x})O_3$ (PZT) and ferroelectric polymers, wherein x is between 0 and 1.

18. (*previously presented*) The sensor of claim 15 wherein said transducer is a thin film.

19. (*previously presented*) The sensor of any one of claim 15 wherein said analyte is one of protein, DNA, virus, antigen-antibody, bacteria, fungus, and drug.

20-23. (*canceled*)

24. (*currently amended*) The sensor of claim [[22]]15, ~~further comprising a probe molecule attached to said transducer, said probe molecule~~ wherein said test surface comprises a coating of probe molecules having specific affinity to said analyte, said analyte being ~~bond~~ bound to said probe molecule.

25. (*new*) The method of claim 1, wherein said second electrode is movable relative to said ferroelectric transducer.

26. (*new*) The sensor of claim 15, wherein said second electrode is movable relative to said ferroelectric transducer.

27. (*new*) The method of claim 9, wherein said thin film is about 180nm thick.

28. (*new*) The sensor of claim 18, wherein said thin film is about 180nm thick.